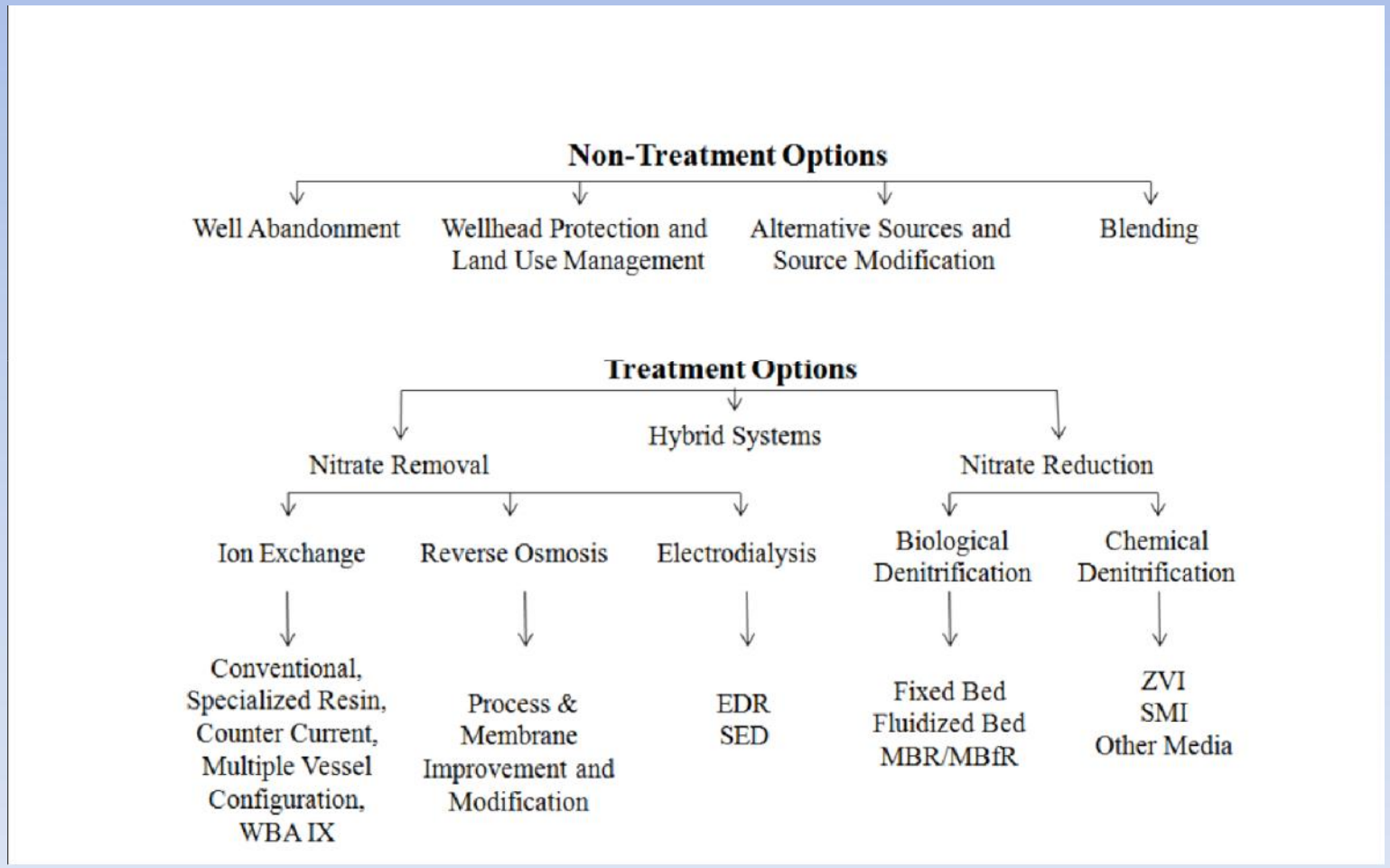
DISPOSAL OPTIONS FOR TREATMENT RESIDUALS FROM DRINKING WATER TREATMENT SYSTEMS

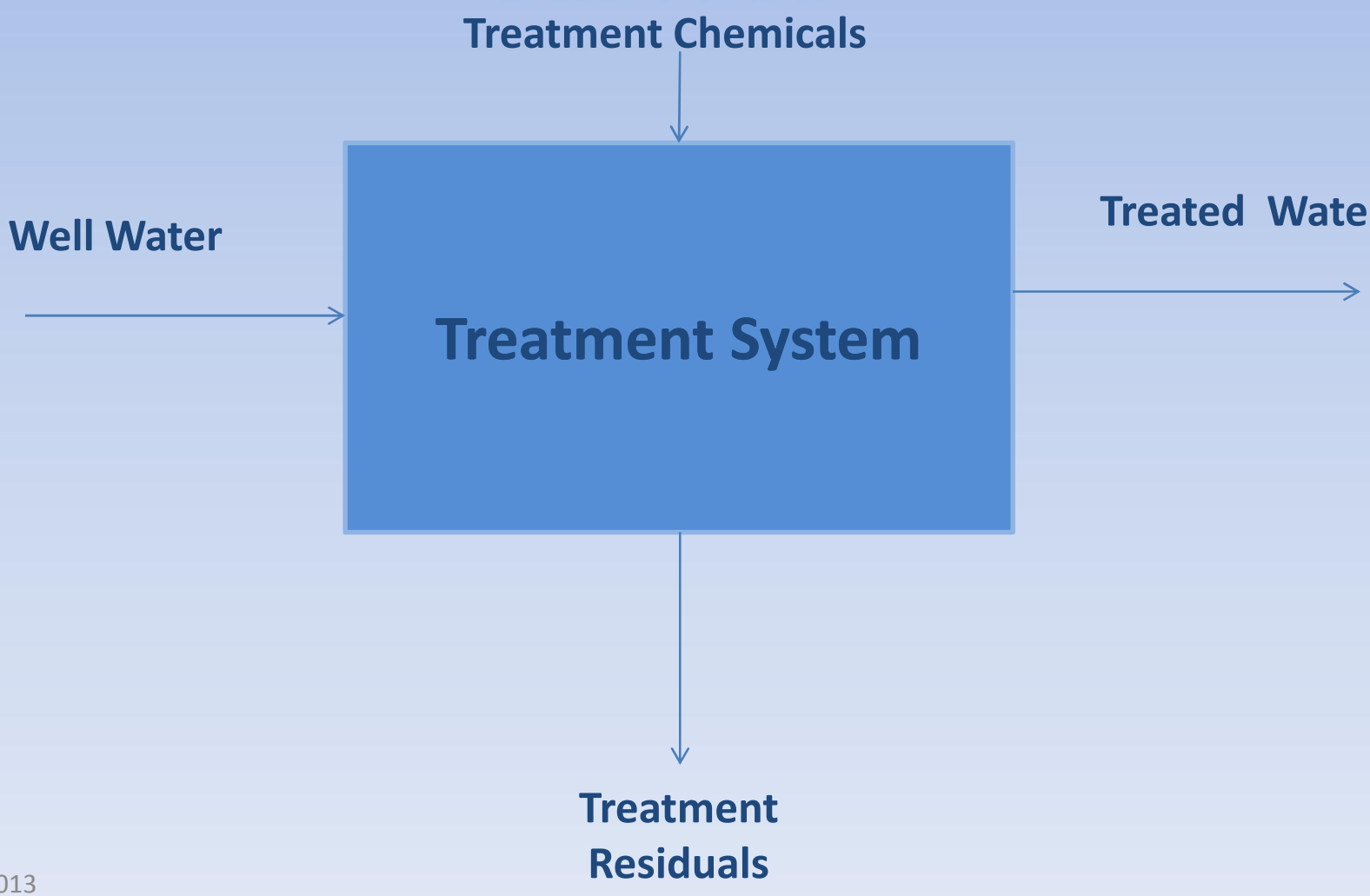
DRINKING WATER OPTIONS



EXISTING DRINKING WATER TREATMENT FACILITIES

- At least 33 Facilities
- Majority are located in the Santa Ana Region
  - In the Santa Ana Region, disposal of brine is to Inland Empire Brine Line, previously referred to as the Santa Ana Regional Interceptor (SARI Line)
- Majority are ion exchange
- All produce concentrated residual
- Various disposal methods

DRINKING WATER TREATMENT SYSTEM



CHARACTERISTICS OF TREATMENT RESIDUALS

- Nitrates
- Other anionic and cationic salts
- Metals
- Arsenic
- Biomass

OPTIONS FOR DISPOSAL OF CONCENTRATED RESIDUALS

- Discharge to a public sewer system
- Discharge to a “Brine Line”
- Evaporation (waste volume reduction)
- Deep well injection
- Percolation
- Advanced treatment for reuse

DISCHARGE TO A PUBLIC SEWER SYSTEM

- Treatment residuals disposal to a public sewer system include:
  - Discharge to a sewer line that goes to a POTW
  - Hauled to a POTW and discharged to the headworks
- POTWs are regulated by the Regional Water Boards:
  - Discharge Permit/Order
  - Conditional Waiver
  - Limits for TDS and nitrates may apply to industrial discharges
- Conveyance Options: discharge to sewer (larger volume) or "tank and haul" (small volume)
- Permitting: obtain approval from POTW/sewer system owner

DISCHARGE TO BRINE LINE

- Brine Lines are not available in all areas
- Regulated by the Regional Water Boards if they discharge directly to surface waters:
  - Discharge Permit
  - Limits for nitrates and organic matter may apply
- Conveyance Options: pipeline to connect to brine line (larger volume) or “tank and haul” (small volume)
- Permitting: obtain approval from system owner

EVAPORATION

- Class II Surface Impoundment (Title 27)
  - Regulated by the Regional Water Boards under WDRs issued to owner/operator
  - Usually constructed at site of waste generation
  - Requires lining system to protect groundwater
  - Periodic solids removal to maintain capacity
- Brine Evaporator ("Zero Liquid Discharge")
  - Removes most of the liquid for reuse
  - Solids may be usable, but likely will be nonhazardous solid waste

DEEP WELL INJECTION

- Regulated by the U.S. EPA under Underground Injection Control (UIC) permit (Class 1, non-hazardous)
- May be constructed at site of waste generation (large volume)
- May be possible to "tank and haul" to nearby existing well (small volume; there are only 46 of these wells in California)
- Very deep wells (>1,700 feet) are expensive to construct; may be cost prohibitive

DISPOSAL BY PERCOLATION

- Includes ponds, leachfields, other subsurface disposal; exposure to atmosphere evapoconcentrates the waste
- Regulated by the Regional Water Boards under WDRs issued to owner/operator
- Usually constructed at site of waste generation
- Requires compliance with Antidegradation Policy and Basin Plan
- May not be permissible depending on volume, character, and underlying groundwater quality

REUSE

- May be regulated by the Regional Water Boards under Discharge Permit/Order issued to owner/operator if a discharge to land or surface water is involved
- Requires compliance with Antidegradation Policy and Regional Board Basin Plan
- May not be permissible depending on volume, character, and underlying groundwater quality
- Brines containing primarily nitrate may be used as fertilizer; probably not feasible for high TDS brines

PERMITTING REQUIREMENTS

- Discharges to land and surface waters are regulated by the State and Regional Water Boards
- Discharge Permits/Orders
- Conditional Waivers
- Permits must implement applicable policies and regulations

OTHER CONSIDERATIONS AND GAPS

- **If State and Regional Boards do not issue a permit:**
  - **Potential for non-compliance with disposal regulations**
- **Inability to track the volume of all waste produced and where it is disposed**
- **Recommend that agencies and dischargers coordinate to ensure that appropriate disposal is being used**

TAKE HOME MESSAGE

- Disposal of Brines is a challenge that requires careful planning and coordination
- Variety of treatment options
- Disposal of related waste must comply with applicable regulations and policies